CLAIMS:

1. A process for producing a polyolefin having a multimodal molecular weight distribution, which process comprises:

(a) polymerising a first olefin monomer in the presence of a bisindenyl metallocene catalyst, to form a first multimodal polyolefin component, said bisindenyl metallocene catalyst being represented by formula (I)

$$(Ind)_2R''MQ_p \qquad (I)$$

wherein each Ind is the same or different and is a substituted or unsubstituted indenyl group, or a substituted or unsubstituted tetrahydroindenyl group; R" is a structural bridge imparting stereorigidity to the component; M is a metal atom from group IVB, VB or VIB of the periodic table; p is the valence of M minus 2; and each Q is a hydrocarbon having from 1-20 carbon atoms or is a halogen.

and

(b) polymerising a second olefin monomer in the presence of a second metallocene catalyst to form a second polyolefin component, said second metallocene catalyst being represented by formula (II)

$$R''(CpR^1R^2R^3)(Cp'R_n')\,MQ_2 \qquad (II)$$

wherein Cp is a substituted or unsubstituted cyclopentadienyl ring; Cp' is a substituted or unsubstituted fluorenyl ring; R" is a structural bridge imparting stereorigidity to the component; R^1 is a substituent on the cyclopentadienyl ring which is distal to the bridge, which distal substituent comprises a hydrogen or a bulky group of the formula XR^*_3 in which X is chosen from Group IVA, and each R* is the same or different and chosen from hydrogen or hydrocarbyl of from 1 to 20 carbon atoms; R^2 is a substituent on the cyclopentadienyl ring which is proximal to the bridge and positioned *non-*

vicinal to the distal substituent and is a hydrogen or is of the formula $YR\#_3$ in which Y is chosen from group IVA, and each R# is the same or different and chosen from hydrogen or hydrocarbyl of 1 to 7 carbon atoms, R^3 is a substituent on the cyclopentadienyl ring which is proximal to the bridge and is a hydrogen or is of the formula $ZR\$_3$, in which Z is chosen from group IVA, and each R$ is the same or different and chosen from hydrogen or hydrocarbyl of 1 to 7 carbon atoms; n is an integer of from 0-8; each R'_n is the same or different and is a group AR'"3 in which A is chosen from group IVA and each R'" is the same or different and chosen from hydrogen or a hydrocarbyl having 1 to 20 carbon atoms; wherein X, Y, Z and A are independently selected from carbon and silicon; M is a Group IVB transition metal or vanadium; and each Q is hydrocarbyl having 1 to 20 carbon atoms or is a halogen,

wherein the molecular weight distribution of the first polyolefin component overlaps with the molecular weight distribution of the second polyolefin component.

2. A process according to claim 1, wherein the first polyolefin component comprises a bimodal polyolefin.

3. A process according to claim 1 or claim 2, wherein the second polyolefin component comprises a monomodal polyolefin.

4. A process according to claim 1, wherein the indenyl groups of the catalyst are unsubstituted or are substituted at the 2, 2', 4 and/or 4' positions.

5. A process according to claim 4, wherein the indenyl groups are symmetrically substituted.

6. A process according to claims 4 or claim 5 wherein the indenyl groups of the catalyst are substituted by a bulky group at the 4 and/or 4'-position.

7. A process according to claim 6, wherein the bulky group is selected from a methyl group, an isopropyl group, a tertiary butyl group, a trimethylsilyl group, and a phenyl group, which optionally may form a benzindenyl group with the indenyl to which it is attached.

8. A process according to any of claims 4 to 7, wherein the 2 and/or 2'-position is substituted by a methyl group.

9. A process according to any of claims 4 to 8, wherein the bridging group R" is a C_1-C_4 alkylene group.

10. A process according to claim 9, wherein the bridging group comprises a substituted or unsubstituted ethylene group.

11. A process according to claim 1, wherein in the cyclopentadienyl-fluorenyl group, R^1 is selected from $C(CH_3)_3$, $C(CH_3)_2Ph$, CPh_3 and $Si(CH_3)_3$.

12. A process according to any claim 1 or claim 11, wherein R^2 is CH_3.

13. A process according to any one of claims 1, 11 or 12, wherein R^3 is CH_3.

14. A process according to claim 1 or any one of claims 11 to 13, wherein n is 2.

15. A process according to any of claims 11 to 14, wherein the fluorenyl group is substituted at the 3-position and the 6-position.

16. A process according to any of claims 11 to 15, wherein each R' is selected from $C(CH_3)_3$ and $Si(CH_3)_3$.

17. A process according to any of claims 11 to 16, wherein the R' groups are the same.

18. A process according to any of claims 11 to 17, wherein R" is selected from alkylidene having 1-20 carbon atoms, a dialkyl germanium or silicon or siloxane, an alkyl phosphine and an amine.

19. A process according to claim 18, wherein R" is isopropylidene or dimethylsilanediyl.

20. A process according to any of claims 11 to 19, wherein the fluorenyl ring is unsubstituted at both positions 4 and 5.

21. A process according to any one of claim 1 or claims 4 to 20, wherein M is zirconium or titanium.

22. A process according to any one of claim 1 or claims 4 to 21, wherein Q is halogen.

23. A process according to any preceding claim, wherein the steps (a) and (b) take place in a single reaction zone.

24. A process according to any preceding claim, wherein the steps (a) and (b) take place in two or more reaction zones in series.

25. A process according to any preceding claim, which process is for producing a polyethylene or a polypropylene.

26. A polyolefin obtainable according to a process as defined in any of claims 1 to 25.

27. A multisite catalyst system for producing a polyolefin having a multimodal molecular weight distribution, which catalyst system comprises two or more catalyst components immobilised on a support, wherein the catalyst components comprise a first catalyst component as defined in any one of claims 1, or 4 to 10, or 21 to 22 and a second catalyst component as defined in any one of claims 11 to 22.

28. Use of a multisite catalyst system as defined in claim 27, to produce a polyolefin having a controlled multimodal molecular weight distribution.